SEL UNIVERSITY
POWER THROUGH KNOWLEDGE

Negative Indices

Video Script

$$\frac{4^3}{4^5} = \frac{4 \times 4 \times 4}{4 \times 4 \times 4 \times 4 \times 4} = \frac{1}{4 \times 4} = \frac{1}{4^2}$$

We have four to the third power divided by four to the fifth power. We can expand this to four times four times four divided by four times four times four times four times four. Once we cancel out the fours from the numerator and denominator, we are left with one divided by four times four, or one over four squared.

$$\frac{4^3}{4^5} = 4^{(3-5)} = 4^{-2}$$

If we apply what we learned earlier this section on the Quotient or Division of Powers slide, we know that we can subtract the indices. four to the power of three minus five, or four to the power of negative two.

$$4^{-2} = \frac{1}{4^2}$$

Therefore, four to the power of negative two is equal to one divided by four squared. Raising a number to a negative power equals the reciprocal of the same number raised to a positive power.